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EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
Eighty-fourth Meeting
Montreal, 16–20 December 2019

PROJECT PROPOSAL: BAHRAIN

This document consists of the comments and recommendation of the Secretariat on the following project proposal:

Phase-out

• HCFC phase-out management plan (stage I, third and fourth tranche)	UNEP and UNIDO

PROJECT EVALUATION SHEET – MULTI-YEAR PROJECTS

Bahrain

(I) PROJECT TITLE	AGENCY	MEETING APPROVED	CONTROL MEASURE
HCFC phase out plan (Stage I)	UNEP (lead), UNIDO	68th	39% by 2023

(II) LATEST ARTICLE 7 DATA (Annex C Group l)	Year: 2018	40.65 (ODP tonnes)

(III) LATEST COUNTRY PROGRAMME SECTORAL DATA (ODP tonnes)									Year: 2018
Chemical	Aerosol	Foam	Fire fighting	Refrigeration		Solvent	Process agent	Lab use	Total sector consumption
				Manufacturing	Servicing				
HCFC-22				21.45	17.88				39.33
HCFC-141b					0.21				0.21
HCFC-141b in imported pre-blended polyol		21.17							21.17

(IV) CONSUMPTION DATA (ODP tonnes)			
2009 - 2010 baseline:	51.29	Starting point for sustained aggregate reductions:	61.39
CONSUMPTION ELIGIBLE FOR FUNDING (ODP tonnes)			
Already approved:	23.21	Remaining:	38.80

(V) BUSINESS PLAN		2019	2020	2021	Total
UNEP	ODS phase-out (ODP tonnes)	1.03	0.0	0.45	1.48
	Funding (US $)	141,250	0	62,150	203,400
UNIDO	ODS phase-out (ODP tonnes)	7.74	0.0	5.95	13.69
	Funding (US $)	1,002,211	0	770,811	1,773,022

(VI) PROJECT DATA*			2012	2014	2015	2016	2017	2018	2019	2020	Total
Montreal Protocol consumption limits			n/a	51.90	51.90	46.71	46.71	46.71	46.71	33.74	n/a
Maximum allowable consumption (ODP tonnes)			n/a	51.77	51.77	46.45	45.39	43.54	37.27	33.74	n/a
Agreed funding (US $)	UNEP	Project costs	120,000	145,000	0	0	0	0	180,000	25,000	470,000
		Support costs	15,600	18,850	0	0	0	0	23,400	3,250	61,100
	UNIDO	Project costs	549,455	0	0	0	0	0	0	0	549,455
		Support costs	38,462	0	0	0	0	0	0	0	38,462
Funds approved by ExCom (US $)		Project costs	669,455	0	0	0	0	0	0	0	814,455
		Support costs	54,062	0	0	0	0	0	0	0	72,912
Total funds requested for approval at this meeting (US $)		Project costs							**180,000**		180,000
		Support costs							**23,400**		23,400

(*) Revised agreement to be considered at the 84th meeting.

Secretariat's recommendation:	Individual consideration

PROJECT DESCRIPTION

Background

1. Stage I of the HCFC phase-out management plan (HPMP) for Bahrain, approved at the 68th meeting to achieve 35 per cent reduction in HCFC consumption by 2020 It included an investment component to convert one manufacturing line in Awal Gulf Manufacturing Company (AGM), with a consumption of 254.90 metric tonnes (14.02 ODP tonnes) of HCFC-22, representing over 27 per cent of the HCFC baseline.

2. Conversion of the project started immediately after it was approved, with the test and trial of two potential technologies, HFC-32 and HC-290, which concluded with the selection of HFC-32 as the most viable option. Subsequently, at the 80th meeting, the Government Bahrain submitted a request to the Committee to revise its Agreement to extend the implementation period from 2012-2020 to 2012-2023, as the conversion of AGM was delayed and could not be implemented before 2020. The Executive Committee approved the revision of the Agreement.

3. However, on 27 June 2019, AGM wrote officially to the Government of Bahrain, outlining concerns regarding conversion to HFC-32 technology and the challenges the company would have to overcome to ensure business continuity, as highlighted below:

(a) There are no regulations governing transport, handling, storage and usage of flammable refrigerants in the region (A2L[1] category);

(b) Large compressor manufacturers (e.g., GMCC, Highly, Emerson) are not yet ready to have a scaled production of the required HFC-32 compressor products used in high-ambient-temperature conditions (T3); the compressor manufacturers which manufactures HFC-32 compressors for T3 conditions, have a limited range of products for internal consumption only; and

(c) There are challenges in product acceptance by the market and end-users due to the flammability of the refrigerant; there are concerns in product distribution, installation and field servicing; and product liability policies would need to be established, which would increase product cost and decrease market compatibility.

4. Considering the above, AGM advised that the conversion should be delayed until air-conditioning (AC) equipment with alternative technology is suitable for T3 countries and accepted by the markets and all stakeholders. Accordingly, the Government and AGM submitted a letter to the Executive Committee requesting for project cancellation. Given the large consumption of HCFC-22 by AGM, the Government is also requesting to revise its Agreement with the Executive Committee by: increasing the maximum allowable consumption target for 2020 from 31.66 (39 per cent reduction from the HCFC baseline) to 33.74 ODP tonnes (35 per cent reduction); removing the remaining funding for the project at AGM (UNIDO components); combining the third and fourth tranches into one tranche; and shortening the implementation period from 2012-2023 to 2012-2020.

Submission to the 84th meeting

5. Against the above background, on behalf of the Government of Bahrain, UNEP as the lead implementing agency has submitted a request for funding for the third and fourth tranches of stage I of the HCFC phase-out management plan (HPMP), at a total cost of US $180,000, plus agency support

[1] A2L, refrigerants with lower flammability with lower flame propagation, i.e., any flame will have a burning velocity of less than 10 cm/sec.

costs of US $23,400 for UNEP only.[2] The submission includes a progress report on the implementation of the second tranche, the verification report on HCFC consumption for 2015–2018, a request to revise the Agreement between the Government of Bahrain and the Executive Committee, a request to cancel the investment project for the conversion at AGM, and the tranche implementation plan for 2019 to 2020.

Report on HCFC consumption

6. The Government of Bahrain reported a consumption of 40.65 ODP tonnes of HCFC in 2018, which is 21 per cent below the HCFC baseline for compliance. The 2014-2018 HCFC consumption is shown in Table 1.

Table 1. HCFC consumption in Bahrain (2014-2018 Article 7 data)

HCFC	2014	2015	2016	2017	2018	Baseline
Metric tonnes						
HCFC-22	876.13	829.04	824.23	798.85	735.15	935.80
HCFC-123	2.72	-	2.54	2.91	-	-
HCFC-124	1.63	-	-	-	-	-
HCFC-141b	7.82	3.48	3.55	2.00	1.94	4.00
Sub-total (mt)	**888.30**	**832.53**	**830.32**	**803.76**	**737.09**	**939.70**
HCFC-141b in imported pre-blended polyols	90.10	174.05	172.98	170.46	192.44	91.87*
Total (metric tonnes)	**978.40**	**1,006.58**	**1,003.30**	**974.22**	**929.53**	
ODP tonnes						
HCFC-22	48.19	45.60	45.33	43.94	40.43	51.5
HCFC-123	0.054	-	0.051	0.058	-	0
HCFC-124	0.04	-	-	-	-	0
HCFC-141b	0.86	0.38	0.39	0.22	0.21	0.4
Sub-total (ODP tonnes)	**49.14**	**45.98**	**45.77**	**44.21**	**40.65**	**51.9**
HCFC-141b in imported pre-blended polyols	9.9	19.15	19.03	18.75	21.17	10.11*
Total (ODP tonnes)	**59.05**	**65.13**	**64.80**	**62.97**	**61.82**	

*Average consumption between 2007 and 2009.

7. The HCFC consumption in Bahrain has been decreasing due to the enforcement of the licensing and quota system, the conversion of the HCFC-22-based AC manufacturing sector to other alternatives, and the phase-out activities so far implemented in the refrigeration servicing sector. The HCFC-141b contained in imported pre-blended polyols has slightly increased due to economic development. The Government is considering addressing this consumption during implementation of stage II.

Country programme (CP) implementation report

8. The Government of Bahrain reported HCFC sector consumption data under the 2018 CP implementation report that is 1.11 ODP tonnes less than the amount reported under Article 7 of the Montreal Protocol. This is due to additional HCFC-22 imported for stockpiling.

Verification report

9. The verification report confirmed that the Government is implementing a licensing and quota system for HCFC imports and exports, and that the total consumption of HCFCs from 2015 to 2018 was 45.98, 45.72, 44.16 and 40.64 ODP tonnes, which are consistent with the A7 data respectively. The

[2] As per the letter of 4 October 2019 from the Supreme Council for the Environment (SCE), Kingdom of Bahrain, to UNEP.

verification concluded that Bahrain is in compliance with the control targets set in the Agreement with the Executive Committee.

Progress report on the implementation of the second tranche of the HPMP

Legal framework

10. Bahrain has established an operational licensing and quota system for HCFCs. The Supreme Council for the Environment (SCE) establishes the import quota based on the maximum allowable consumption under the Montreal Protocol and distributes it among importers according to their historical imports.

11. The Government has issued Law 54/2014 to enforce the Unified Regulation of the Gulf Cooperation Council for Arabian Gulf States (GCC). This Regulation controls import, export and trade of ODS and ODS-based equipment among GCC countries; it sets penalties for violations and mandates the SCE to issue the respective by-laws. The by-law for controlling ODS and ODS equipment has been completed and is at the final stage of enacting; it covers the control of trade of substances and equipment; mandatory certification of refrigeration technicians and service companies; prohibition of venting refrigerants into the atmosphere; mandatory recovery and reclaim of refrigerants; control of refrigerant containers; and monitoring leaks of large-sized applications.

Manufacturing sector

12. Subsequent to the approval of the project to convert one manufacturing lines in AGM, test and trial of two alternative technologies for both split and central unit were undertaken. As the Government and AGM agreed to cancel the project, the funding approved in principle for covering the cost of conversion, which was scheduled in the third and fourth tranches, would not be requested.

Refrigeration servicing sector

13. The following activities were conducted during the second tranche:

(a) Five training workshops were conducted and 100 customs officers, government officials, importers and distributors have been trained in the licensing and quota system, the use of seven refrigerant identifiers that were purchased, control and monitoring of ODS, prevention of illegal trade; training is also being provided to officials on the recently developed e-licensing system;

(b) The development of an e-licensing system for monitoring imports/exports of ODS and ODS products has been completed and is expected to become operational shortly. The system also includes the monitoring of ODS alternatives;

(c) The development of national standards and codes for the use of hydrocarbon and ammonia refrigerants, labeling requirements, record keeping and reporting of HCFC consumption has continued;

(d) The establishment and commissioning of the national HCFC reclamation center; training on the operation of the center was provided and the center is operational;

(e) Procedures for mandatory certification of technicians have been established; five training workshops were held and 22 trainers and 220 technicians were trained under the technician certification programme; tools and equipment were provided to training centers; and

(f) Two training workshops were conducted for Government officials, importers, servicing companies, contractors and end-users, to raise awareness on the new ozone regulations.

Project implementation and monitoring unit (PMU)

14. The PMU disbursed a total of US $44,684 for the implementation of the following activities:

(a) Preparing and reviewing the detailed work plan for the project;

(b) Forming the project steering team (PST) (UNEP, NOU and SCE) and the different teams and groups within the work plan of the HPMP;

(c) Organizing all relevant workshops, training programmes and events within the work plan of the HPMP;

(d) Drafting, finalizing, developing and circulating support documentation and awareness materials after clearance from the PST;

(e) Monitoring the progress of project activities and reporting to the PST; and

(f) Providing a progress report to UNEP as per the contract between UNEP and the Bahrain Society of Engineers (BSE).

Level of fund disbursement

15. As of October 2019, of the US $814,455 approved so far, US $804,743 had been disbursed (US $255,787 for UNEP and US $548,456 for UNIDO) as shown in Table 2. The balance of US $9,712 will be disbursed in 2020.

Table 2. Financial report of stage I of the HPMP for Bahrain (US $)

Agency	First tranche		Second tranche		Total approved	
	Approved	**Disbursed**	**Approved**	**Disbursed**	**Approved**	**Disbursed**
UNEP	120,000	120,000	145,000	135,787	265,000	255,787
UNIDO	549,455	548,756	0	0	549,455	548,456
Total	669,455	668,756	145,000	135,787	814,455	804,743
Disbursement rate (%)	99.9		93.6		98.8	

Implementation plan for the third and fourth tranches of the HPMP

16. The third and fourth combined tranches include funding for UNEP, for the following activities that will be implemented in 2020:

(a) Training of 200 customs officers, government officials, importers and distributors on ODS regulations, monitoring and prevention of illegal trade (US $15,000);

(b) Purchasing of seven refrigerant identifiers capable of identifying blends (US $25,000);

(c) Development of national standards and codes for labeling requirements, record keeping and reporting of HCFC consumption; standards for equipment and installations operating with hydrocarbon and ammonia refrigerants; codes for handling and disposal of refrigerant cylinders; (US $35,000);

(d) Training of 100 technicians in the use and handling of new alternative refrigerants including flammable, toxic and high-pressure refrigerants (US $30,000); and

(e) Independent verification of national consumption (US $15,000).

PMU

17. The activities to be conducted by the PMU and the associated budget are shown below:

(a) Undertake the preparation and review of the detailed work plan for the project (US $5,000);

(b) Form different teams and working groups within the work plan of the HPMP (US $5,000);

(c) Organize all relevant workshops, training programs and events within the work plan of the HPMP (US $20,000);

(d) Draft, finalize, develop and circulate relevant support documentation and awareness materials (US $20,000);

(e) Monitor the progress of the project and report to the project steering team (US $5,000); and

(f) Prepare reports to UNEP as per the contracting arrangement between UNEP and the BSE (US $5,000).

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

Progress report on the implementation of the second tranche of the HPMP

Legal framework

18. The Government of Bahrain has issued HCFC import quotas for 2019 at 37.27 ODP tonnes and for 2020 at 33.74 ODP tonnes (equal to the maximum allowable level of consumption), in accordance with the Montreal Protocol control targets.

Manufacturing sector

19. UNEP confirmed that AGM will completely phase out 254.9 mt (14.02 ODP tonnes) of HCFC-22 related to the cancelled conversion project with its own funding. Upon a request of information about the current status of the HCFC-22 manufacturing lines at AGM and its plan to phase out the associated consumption of HCFC-22, UNEP provided the production output and consumption up to 2020 based on the business plan and the market, which indicated a continuous decrease in the manufacturing of HCFC-22-based units, as shown in Table 3.

Table 3: Output of HCFC-22-based units and HCFC-22 consumption in AGM

Product	2016		2017		2018		2019		2020	
	Unit	mt	Unit	mt	Unit	mt	Unit	mt	Unit	mt
Window AC	200,000	297	180,000	267	165,600	248	154,008	231	130,907	198
Split AC	35,000	77	31,500	69	28,980	64	26,951	60	22,909	51
Central unit	7,000	63	6,300	57	5,796	53	5,390	49	4,582	42

Product	2016		2017		2018		2019		2020	
	Unit	mt	Unit	mt	Unit	mt	Unit	mt	Unit	mt
Water cooler	10,000	14	9,000	12	8,280	11	7,700	11	6,545	9
Total	252,000	450	226,800	405	208,656	375	194,050	350	164,943	300

20. AGM plans to continue to operate HCFC-22 manufacturing lines for window units, central units and water coolers until 2025 to meet market demand; and it does not have plans to convert these HCFC product lines to R-410A.

21. The cancellation of the conversion project at AGM triggered a discussion on whether Bahrain would be able to achieve compliance with the Montreal Protocol and the control target in the Agreement with the Executive Committee in 2020. UNEP informed that Bahrain is very determined to maintain its legacy of full compliance with the Montreal Protocol and thus will spare no effort to achieve the reduction target in 2020, through applying maximum control on the supply and demand of HCFCs. To reduce the supply, the Government will strictly enforce the licensing and quota system; to reduce the demand, the recovery, recycling and reclamation scheme will be fully operational, and training on good servicing practices for technicians and the technician certification programme will be enhanced. Moreover, AGM will also convert part of its production to alternatives to non-HCFC technologies, comply with energy-efficiency requirements and satisfy the market.

Refrigeration servicing sector

22. Upon an inquiry, UNEP reported that the consumption of pure HCFC-141b used for flushing refrigeration circuits has been decreasing due to the training and awareness raising activities implemented in stage I. The Government will not issue an import quota of pure HCFC-141b from 2020, and will continue implementing training programmes and technical assistance on the use of alternatives in stage II.

23. The Secretariat noted that a comprehensive programme has been implemented in the servicing sector, including a technician certification scheme supported by regulations; training of technicians under the certification programme; and the establishment of a recovery, recycling and reclamation network. These measures will assist Bahrain in reducing HCFC consumption and achieving compliance with the reduction targets in 2020.

Sustainability of the HCFC phase-out

24. A technician certification scheme with regulatory support is being implemented to achieve sustainability in the training of technicians in good servicing practices and in the servicing of equipment with alternative technologies. The Government of Bahrain continued developing a legal framework to create an enabling environment for sustainable phase-out, including the introduction of national standards and codes for labeling requirements, record keeping, and reporting requirements, a standard for equipment operating with alternatives, and a code for handling and disposal of refrigerant cylinders. A licensing and quota system is being enforced and an e-licensing system has been developed to facilitate instant data sharing and efficient communication among different stakeholders, which will sustain the HCFC import control.

Revision of the Agreement

25. Based on the request from the Government of Bahrain to revise its Agreement with the Executive Committee as a result of the cancellation of the conversion project at AGM, the Secretariat will update the Appendix 2-A of the Agreement to reflect the revised target for 2020, funding schedule and the implementation period of stage I of the HPMP. Paragraph 16 has been revised to indicate that the updated Agreement will supersede the Agreement between the Government of Bahrain and the

Executive Committee that was reached at the 80th meeting, as shown in Annex I to the present document. The full revised Agreement will be appended to the final report of the 84th meeting.

Conclusion

26. Bahrain is implementing a licensing and quota system for the imports and exports of HCFCs. The consumption in 2018 was 40.65 ODP tonnes, which is below the Montreal protocol control target and the target set in the Agreement with the Executive Committee for the year. A comprehensive legal framework is being established to support the sustainable phase-out of HCFCs; the technician certification programme is being implemented and training has been provided to technicians. A refrigerant recovery, recycling and reclamation center has been established and commissioned, which will assist in reducing demand for virgin HCFCs. An e-licensing system has been developed and training is being provided to staff to facilitate the efficient control of HCFC imports and exports. Due to the challenges in adopting flammable refrigerants and the requirements for energy efficiency in RAC products in the regional market, the conversion of the AC manufacturing lines at AGM cannot be implemented within the timeframe of stage I of the HPMP. The enterprise, through the Government and UNIDO, has requested that the conversion project be cancelled and that the remaining funding be returned to the Fund.

RECOMMENDATION

27. The Executive Committee may wish to consider:

(a) Noting:

(i) The progress report on the implementation of the second tranche of stage I of the HCFC phase-out management plan (HPMP) for Bahrain;

(ii) The cancellation of the component to convert one air-conditioning manufacturing line in Awal Gulf Manufacturing Company, and that the enterprise has committed to phase out the consumption of 254.9 mt (14.02 ODP tonnes) of HCFC-22 associated with the conversion with its own funding;

(b) Noting that the Fund Secretariat had revised the updated Agreement between the Government of Bahrain and the Executive Committee, as contained in Annex I to the present document, specifically paragraph 1 and Appendix 2-A, based on the revised target for 2020, funding level and distribution, and implementation period, due to the cancellation of the conversion project at Awal Gulf Co., and paragraph 16 to indicate that the revised updated Agreement superseded that reached at the 80th meeting; and

(c) Approving the combined third and fourth tranches of stage I of the HPMP for Bahrain, and the corresponding 2019-2020 tranche implementation plan, in the amount of US $180,000, plus agency support costs of US $23,400 for UNEP.

Annex 1

TEXT TO BE INCLUDED IN THE UPDATED AGREEMENT BETWEEN THE GOVERNMENT OF THE KINGDOM OF BAHRAIN AND THE EXECUTIVE COMMITTEE OF THE MULTILATERAL FUND FOR THE REDUCTION IN CONSUMPTION OF HYDROCHLOROFLUOROCARBONS

1. This Agreement represents the understanding of the Government of the Kingdom of Bahrain (the "Country") and the Executive Committee with respect to the reduction of controlled use of the ozone-depleting substances (ODS) set out in Appendix 1-A ("The Substances") to a sustained level of **33.74** ODP tonnes by 1 January 2020 in compliance with Montreal Protocol schedules.

16. This updated Agreement supersedes the Agreement reached between the Government of Bahrain and the Executive Committee at the **80th** meeting of the Executive Committee.

APPENDIX 2-A: THE TARGETS, AND FUNDING

Row	Particulars	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
1.1	Montreal Protocol reduction schedule of Annex C, Group I substances (ODP tonnes)	n/a	51.90	51.90	46.71	46.71	46.71	46.71	46.71	33.74	n/a
1.2	Maximum allowable total consumption of Annex C, Group I substances (ODP tonnes)	n/a	51.77	51.77	46.58	46.45	45.39	43.54	37.27	**33.74**	n/a
2.1	Lead IA (UNEP) agreed funding (US $)	120,000	0	145,000	0		0		**180,000**	25,000	470,000
2.2	Support costs for Lead IA (US $)	15,600	0	18,850	0		0		**23,400**	3,250	61,100
2.3	Cooperating IA (UNIDO) agreed funding (US $)	549,455	0	0	0	0	0	0	**0**	0	**549,455**
2.4	Support costs for Cooperating IA (US $)	38,462	0	0	0	0	0	0	**0**	0	**38,462**
3.1	Total agreed funding (US $)	669,455	0	145,000	0		0		**180,000**	**25,000**	**1,019,455**
3.2	Total support costs (US $)	54,062	0	18,850	0		0		**23,400**	**3,250**	**99,562**
3.3	Total agreed costs (US $)	723,517	0	163,850	0		0		**203,400**	**28,250**	**1,119,017**
4.1.1	Total phase-out of HCFC-22 agreed to be achieved under this Agreement (ODP tonnes)										**17.59**
4.1.2	Phase-out of HCFC-22 to be achieved in previously approved projects (ODP tonnes)										0
4.1.3	Remaining eligible consumption for HCFC-22(ODP tonnes)										**33.25**

Row	Particulars	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
4.2.1	Total phase-out of HCFC-141b agreed to be achieved under this Agreement (ODP tonnes)										0.44
4.2.2	Phase-out of HCFC-141b to be achieved in previously approved projects (ODP tonnes)										0.0
4.2.3	Remaining eligible consumption for HCFC-141b (ODP tonnes)										0.0
4.3.1	Total phase-out of HCFC-141b contained in imported pre-blended polyols agreed to be achieved under this Agreement (ODP tonnes)										0.0
4.3.2	Phase-out of HCFC-141b contained in imported pre-blended polyols to be achieved in previously approved projects (ODP tonnes)										0
4.3.3	Remaining eligible consumption for HCFC-141b contained in imported pre-blended polyols (ODP tonnes)										10.11